

REMARKS

Pending Claims:

Claims 1-12 and 14-51 are pending in this application. The status of the claims is as follows:

Currently amended:	1-12, 14, 15, 19, 20, 24, 29, 34, 35, 39-41, 43-47
New:	48-51
Cancelled:	13
Original:	30-32, 42
Previously presented:	16-18, 21-23, 25-28, 36-38

Entry of these amendments is respectfully requested.

Claim Rejections – 35 U.S.C. §103 (Tan + Sicola):

Claims 1-5, 10, 12-19, 24, 26-33, 35, 39, 41-43, 46, and 47 were rejected as being obvious over the combination of Tan et al. (U.S. 2003/0126315, hereinafter "Tan") and Sicola (U.S. 6,601,187). According to the Office Action (OA):

Tan teaches that the failover mechanism (Figure 3) is performed in the Host Bus Adapter 130 in conjunction with redundant storage controllers 324, 330 wherein the redundant storage controllers are array controllers (paragraph 0011). Tan does not teach that the failover mechanism is performed by a storage node. However, Tan teaches that their detailed redundancy environment can be applied to many different redundancy environments including SCSI parallel bus.

(OA p. 10.) Sicola teaches "a failover mechanism . . . performed by the array controllers (Figure 9 and column 13, line 44 to column 14, line 15) and a pair of array controllers are called a storage node (column 8, lines 20-23)."

Claim 1 has been amended to include the steps of:

maintaining a topology database that stores paths through a network which are available to communicably connect a storage node to a host node; and

verifying by the storage node using the topology database that the storage node has at least two paths to the host node.

In other words, the storage node verifies that it has path redundancy back to the host node. Sicola, as in his Figure 9, has a scheme for dealing with failover of a link (901) between two controllers (A1 and B1). A1 is a controller for a first storage array 203, which is mirrored by a second storage array 213, having B1 as a controller. A1 has a partner A2, and B1 has a partner B2. A2 also controls storage array 203, and B2 also controls storage array 213. When link 901 fails, steps are taken to switch controllers from A1/B1 to A2/B2. The scheme is focused upon the storage subsystem. Even if Sicola fixes the link 902, there is no guarantee that storage array 213 has a redundant path to the host, which Sicola does not examine. Also, Sicola is concerned with failover, and not with verifying that redundant paths exist to a host.

Tan teaches looking in the opposite direction, from host adapter to storage. This is a significant functional difference. Tan and Sicola do not combine to produce amended claim 1. Thus, claim 1, and all claims depending directly or indirectly upon claim 1 (i.e., claims 2-12 and 14, and new claims 48-51) should now be allowable.

Like amended Claim 1, amended independent Claim 15 also includes the "topology database" and "verifying using the topology database that the port has at least two paths to the host node" where the port is "within a storage node." Thus, claim 15 and all claims directly or indirectly dependent on claim 15 (i.e., claims 16-28) should be allowable.

Independent claim 29 as amended includes a "processor, coupled to the port, the processor configured for . . . verifying the backup physical interface has a path to the host node after the connection change." The backup physical interface is included in "at least one of the local node and the Fibre Channel network," and the local node is "within a storage device." Note that elements of the network in neither Tan nor Sicola look for a path to the host. Thus, claim 29 should now be allowable, along with the claims that depend directly or indirectly on claim 29 (namely, 30-42).

Independent claim 43 has been amended analogously to claim 1 to include the topology database and verifying that two paths exist from the storage node to a host. Thus, claim 43 and dependent claims 44 and 45 should now be allowable.

Independent claims 46 and 47 have been amended analogously to claim 29, and so claims 46 and 47 should now be allowable.

All amendments to the claims are supported by the specification, at least Figures 1, 2, and 4, and page 13 line 19 - page 14 line 1; page 12 lines 13-15; page 13 lines 3-6; and page 10 line 21 - page 11 line 13.

Claim Rejections – 35 U.S.C. §103 (Tan + Sicola + admitted prior art):

Claims 6-9, 11, 34, 36-38, and 40 were rejected as obvious over Tan and Sicola, in view of specifics of the Fibre Channel standard. The Fibre Channel standard does not provide the backward-facing redundant path verification from storage node to host node described above. Consequently, as stated in the above discussion, these claims should all be allowable.

Claim Rejections – 35 U.S.C. §103 (Tan):

Claims 16-19, 24, 28, and 44 were rejected as being obvious over Tan. According to the Office Action, it would have been obvious over provide a state change notification; use a name table lookup; and take corrective action in response to failover/warning flag. This argument is now moot in light of the modifications to the independent claims, as described above, which relate to other aspects of Applicant's invention.

Claim Rejections – 35 U.S.C. §102 (Tan):

Claims 15, 26, 27, 43, and 46 were rejected as being anticipated by Tan. Because, as described above, these claims, as amended, are not obvious over Tan in combination with Sicola, they are not anticipated by Tan alone. Consequently, this rejection has been overcome.

Claim Rejections – 35 U.S.C. §102 (Tan + admitted prior art):

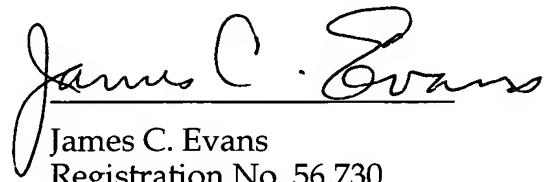
Claims 20-23, 25, and 45 were rejected as being anticipated by Tan in combination with admitted prior art regarding the Fibre Channel standard. Again, neither Tan nor the Fibre Channel Standard teaches the backward-facing verification described above. Consequently, these claims as amended should now be allowable.

CONCLUSION

All of the claims remaining in this application should now be seen to be in condition for allowance. The prompt issuance of a notice to that effect is solicited.

Respectfully submitted,

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